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## A Novel Technique for Complex Rectal Fistula Closure With Ligasure: Efficacy and Functional Outcomes

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**Relevance.** The management of complex rectal fistulas remains one of the most challenging tasks in modern coloproctology. High transsphincteric and extrasphincteric fistulas, recurrent or multi-tract variants, are characterized by complex anatomy, difficulty of radical excision, and a high risk of sphincter damage, often resulting in postoperative fecal incontinence. Traditional surgical techniques, including cutting seton and advancement flap, show limited efficacy in preserving sphincter function and are associated with high recurrence rates (up to 20%) and the risk of incontinence (up to 10–15%). This highlights the urgent need for minimally invasive, sphincter-sparing approaches that can provide radical cure with minimal trauma.

**Objective.** To improve the effectiveness and safety of surgical treatment for complex rectal fistulas through the introduction of a novel minimally invasive technique using the LigaSure bipolar energy device for tract sealing and dissection without compromising sphincter integrity.

**Materials and Methods.** A total of 114 patients with cryptoglandular complex fistulas were included in the study. Patients were divided into two groups: the main group (n=59), who underwent sphincter-preserving surgery using LigaSure, and the control group (n=55), treated with conventional techniques (cutting seton and endorectal advancement flap). We assessed operative duration, intraoperative blood loss, wound healing time, postoperative complications, continence status, and recurrence rate. The follow-up period was 12 months.

**Results.** In the main group, there was a significant reduction in operative time (mean  $32.1 \pm 7.8$  minutes vs.  $45.3 \pm 10.2$  minutes in the control group,  $p < 0.001$ ), blood loss ( $19 \pm 9$  ml vs.  $51 \pm 15$  ml,  $p < 0.001$ ), and wound healing time ( $4.3 \pm 1.5$  weeks vs.  $6.2 \pm 2.1$  weeks,  $p = 0.002$ ). The recurrence rate was 5.1% in the main group compared to 18.2% in the control group ( $p = 0.03$ ). No cases of new-onset fecal incontinence were observed in the LigaSure group, whereas the control group reported incontinence in 7.3% of patients.

**Conclusions.** The application of a minimally invasive, sphincter-preserving surgical technique utilizing LigaSure for the treatment of complex rectal fistulas significantly improves both short- and long-term outcomes. It ensures high rates of fistula healing, reduces recurrence, and preserves anal sphincter function. This method is recommended for wide implementation in specialized proctology centers as a safe and effective alternative to traditional surgical approaches.